# GUJARAT TECHNOLOGICAL UNIVERSITY

## M.E Semester: III

## Civil Engineering (Structural Engineering)

Subject Name: **Design of Earthquake Resistant Structures (Major Elective IV)**

| Sr.No | Course content |
|---|---|
| 1. | Introduction to IS Codal provisions on Earthquake Engineering. |
| 2. | Performance of Building: Behaviour of various types of building s in past earthquakes, Modes of Failure, influence of non-symmetry, infill walls, foundation, soft – storey and detailing of reinforcement in buildings. |
| 3. | Philosophy of earthquake resistant design: Design philosophy, Ductility, Redundancy and Over strength, Damping, Centers of mass and stiffness, Reduction Factor and Lateral Force Distribution |
| 4. | Design Spectrum, Elastic and Inelastic Response Spectrum and analysis. |
| 5. | Pushover Analysis and Time History Analysis: Safety analysis of existing building and strengthening if and where required. |
| 6. | Seismic Design, repair, restoration and strengthening of masonry and framed structures. |
| 7. | Shear walls: Lateral load participation, analysis and design of shear walls with/without boundary elements, openings and coupling beams. |
| 8. | Ductile detailing of RCC Structures. Capacity design concept, strong column weak beam theory. |
| 9. | Introduction to Base Isolation Techniques. |

Reference Books:


1. Paulay T and Priestley, M.J.N.,"Seismic Design of Reinforced Concrete and Masonry Buildings ", John Wiley, 3/e/1995
2. Wakabayshi M, " Design of E. Q. Resistant Building", MaGraw Hill, 2/e/1986
3. Sharma Hemant Kumar and Agrawal G, " E. Q. Resistant Building Constructin", ABD Publishers, Jaipur.
4. Dr. Arya AS et all, " Guidelines for E.Q. Resistant Non-engineered Construction", IAEE Committee, 1/e/1986
5. Joshi DS et all, " Design of RC Structures for E.Q. Resistant", Indian Society of Structural Engineers, 2/e/2001
6. Different IS Codes viz. IS 4326-1993, IS 13827-1933, IS 13828-1993 & IS 13935-1993, IS 13920-1993, IS 1893-2002